

# Application Protocol 212 — Electrotechnical Design and Installation



Solution  
Multivendor  
Simulation

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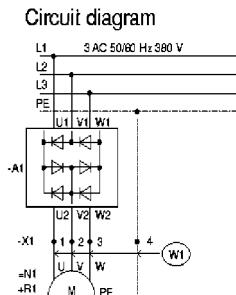
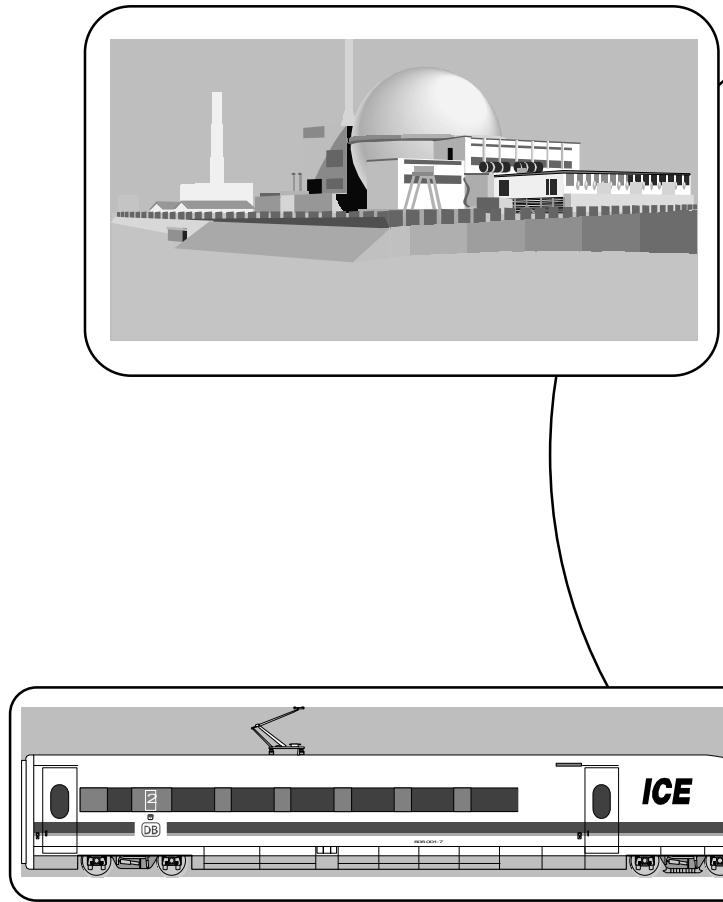
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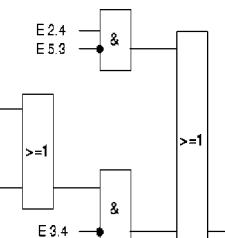
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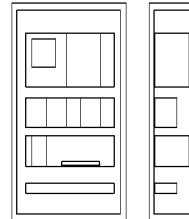
# Electrical Applications



Function diagram

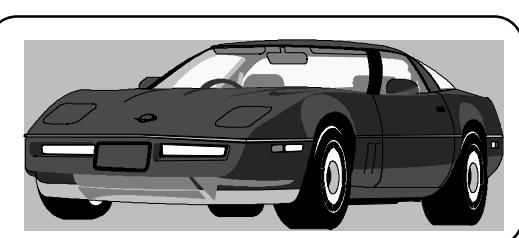


Arrangement drawing



Part list

Item	Amount	Unit	Denomination	Ident number	Item designation
1	4	pc	Terminals	3 WA1	-X1
2	1	pc	SIMOVERT F 6 SE 11		-A1
3	1	pc	Relay	3TH80	-K1



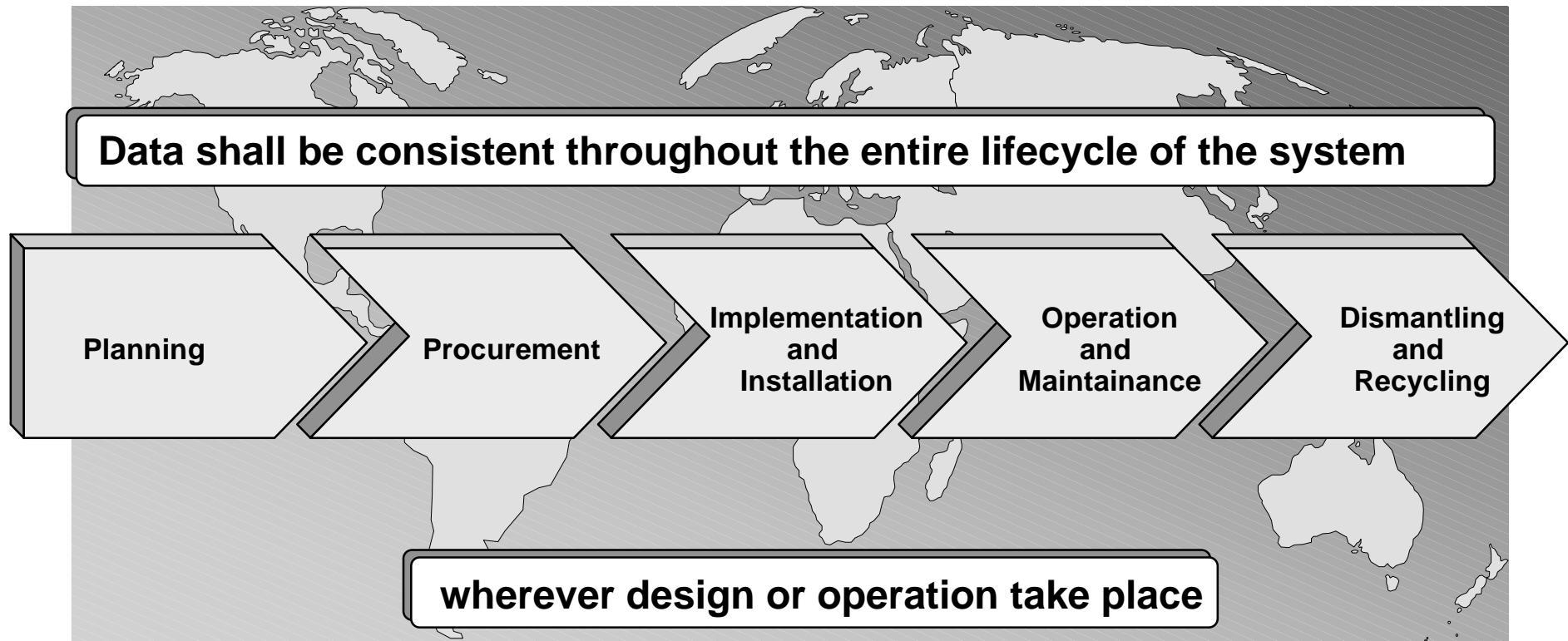
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# Consistency required



# AP 212

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**Application Protocol 212  
was designed to meet  
these requirements**

Standard for the Exchange  
of Product Data

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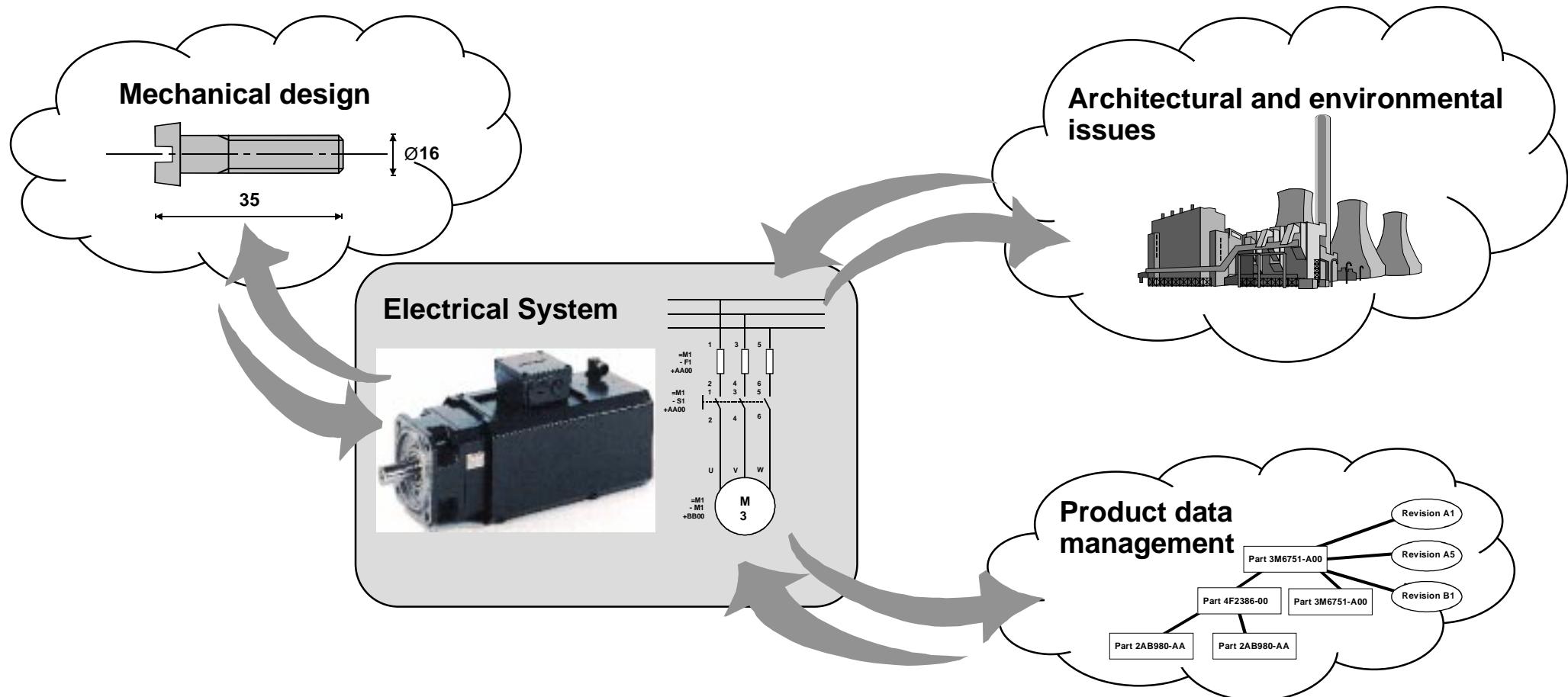
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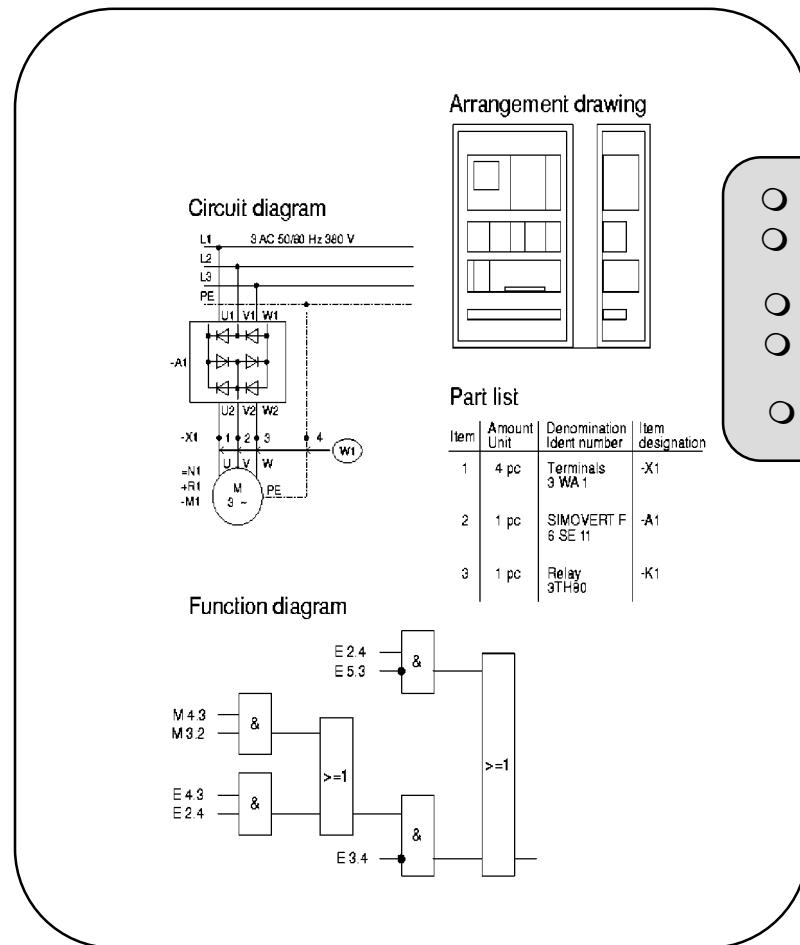
# Many Domains need to collaborate



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# Content of AP 212



## Keeping and exchanging data of Electrotechnical Systems

- Product structure information
- Physical connectivity
- Functional hierarchy
- Functional connectivity
- Signal and Messages

- Configuration management
- Change management
- Documentation
- Requirements

- Shape information

- Location related data
- Cable trays
- Routing

- Classification
- Technical data

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# Who is contributing to AP 212?

## Electrical Industry and Utility Companies

ABB  
AEG  
Bosch  
EFI  
Energieversorgung Schwaben  
Hamburgische Elektrizitätswerke  
Rockwell  
RWE  
Siemens  
Weidmüller

## System vendors

Mentor Graphics  
ProSTEP  
RACOS  
Siemens

## Other Industries

Bayer  
Boeing  
Büro für Informatik, Alfs  
Concad  
CTC  
Daimler Benz  
Dasa  
Delphi Automotive Systems  
Ford  
Fraunhofer Gesellschaft IGD  
General Motors  
GOSET  
Huges Aircraft  
Martin Marietta  
RPK Karlsruhe  
Volkswagen/ Audi



These companies and institutes contributed in the development of AP 212 with their participation in discussions, reviews, or research activities.

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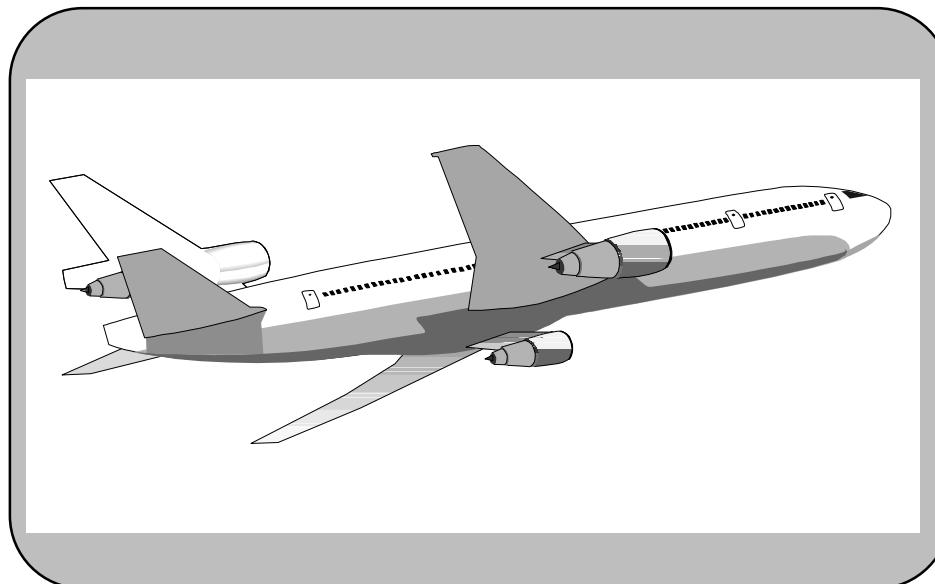
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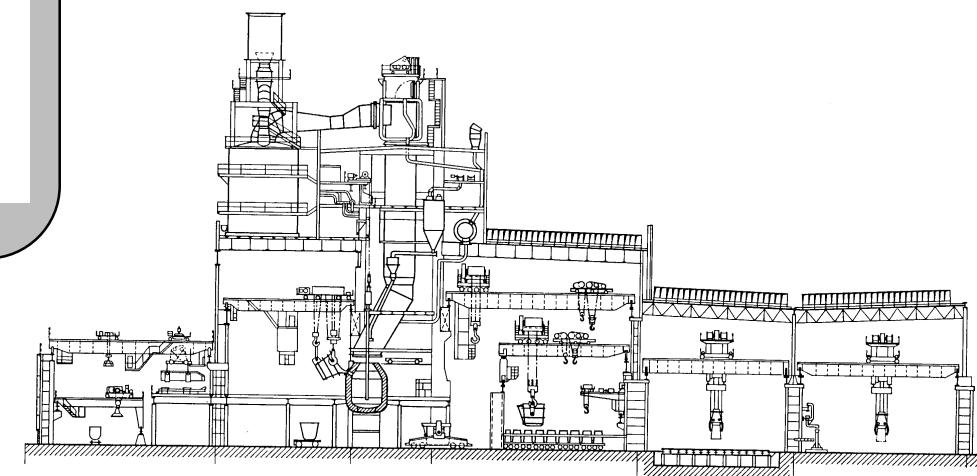
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# Various Electrotechnical Systems



Electrical systems in aircraft



Electrotechnical systems for industrial use

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# Validating AP 212

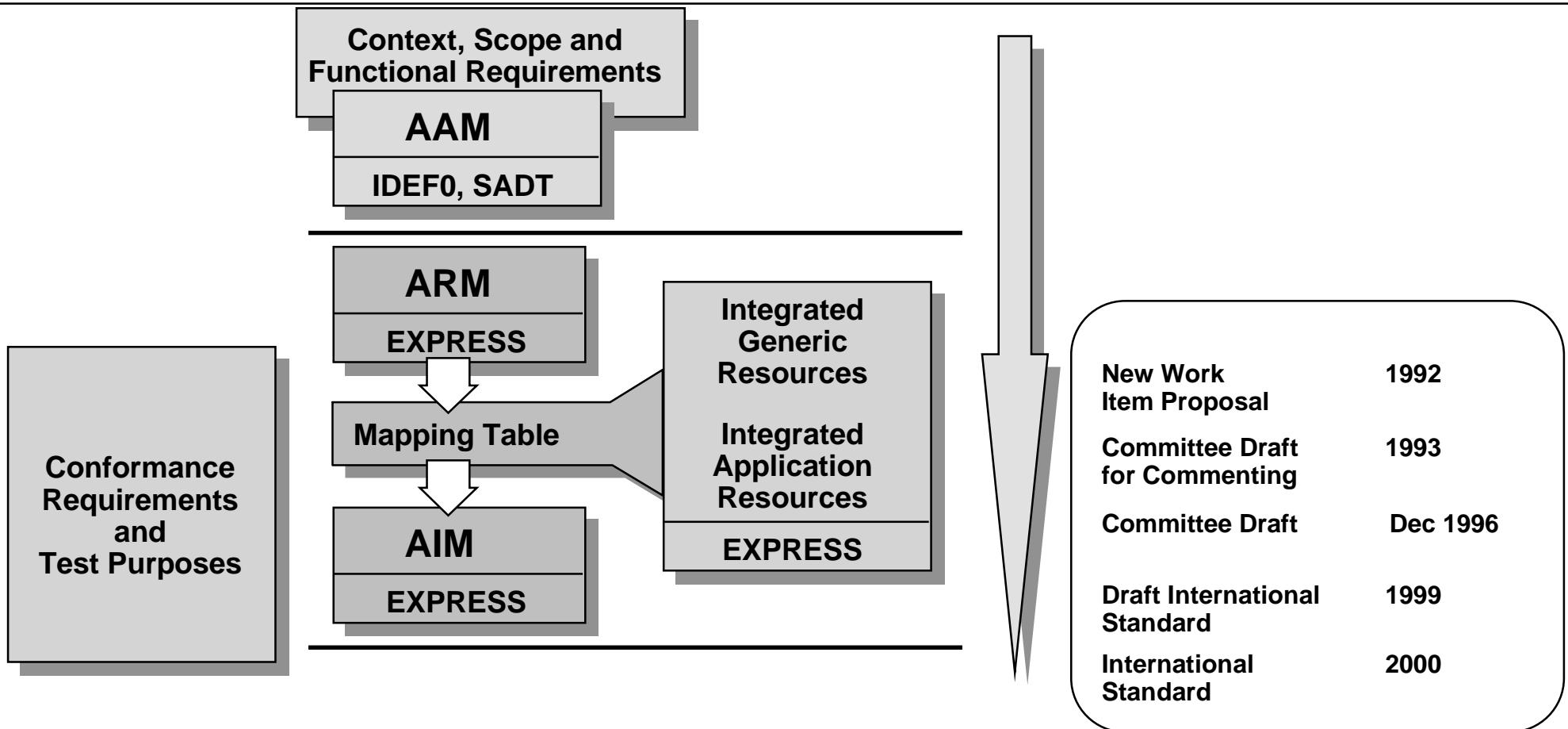


- ➡ **ACORN, Advanced Control Network**  
Distributed control systems in process plants
- ➡ **Interest Group of Utility Companies**  
High-voltage switchgear
- ➡ **Rheinisch Westfälische Elektrizitätswerke**  
Large distribution networks, telecontrol
- ➡ **VDA Working Group 'Process chain car electric'**  
Product data in car electric
- ➡ **Siemens, Power Generation KWU**  
Mapping the data of a documentation tool onto AP 212
- ➡ **Siemens, Industrial and Building Systems**  
Automation in cement industry
- ➡ **and many other small test cases ...**

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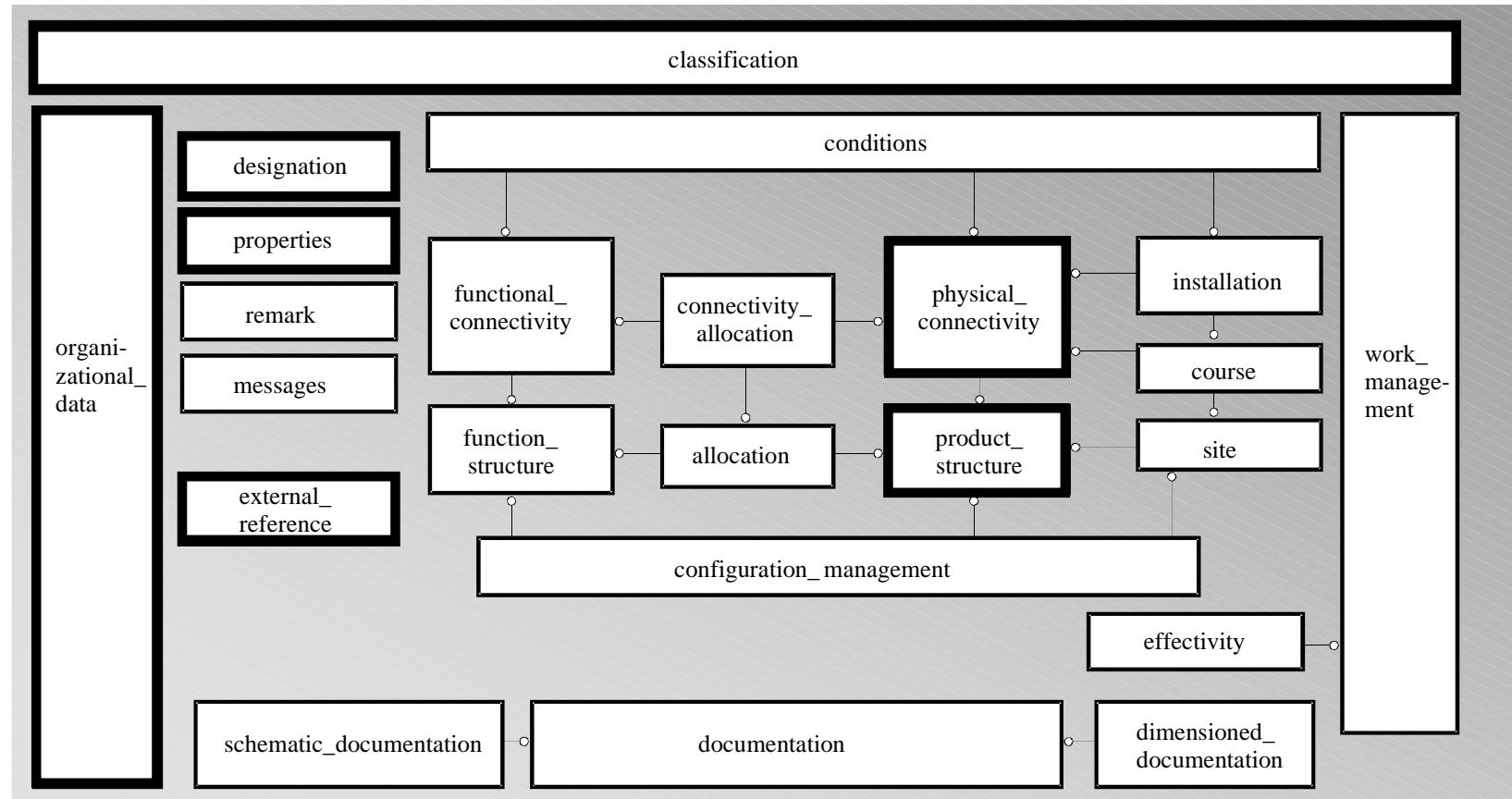
# Schedule



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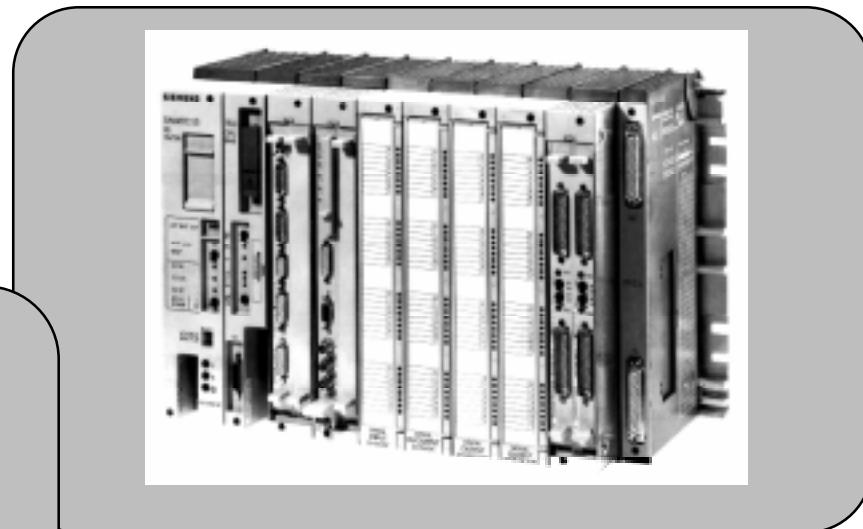
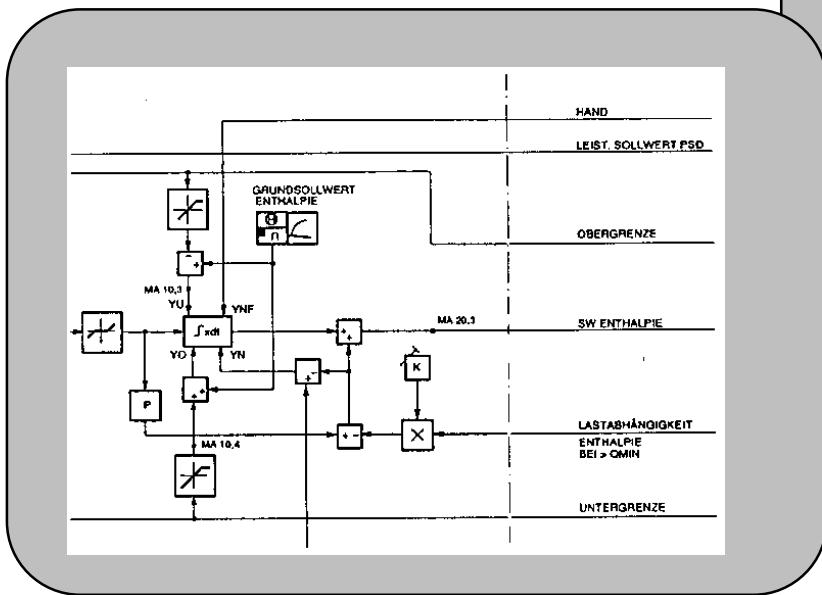


# AP 212 - Units of Functionality



# Product and Function

## Function



Product

Product structure harmonized with AP214

Physical and functional connectivity

Classification of items

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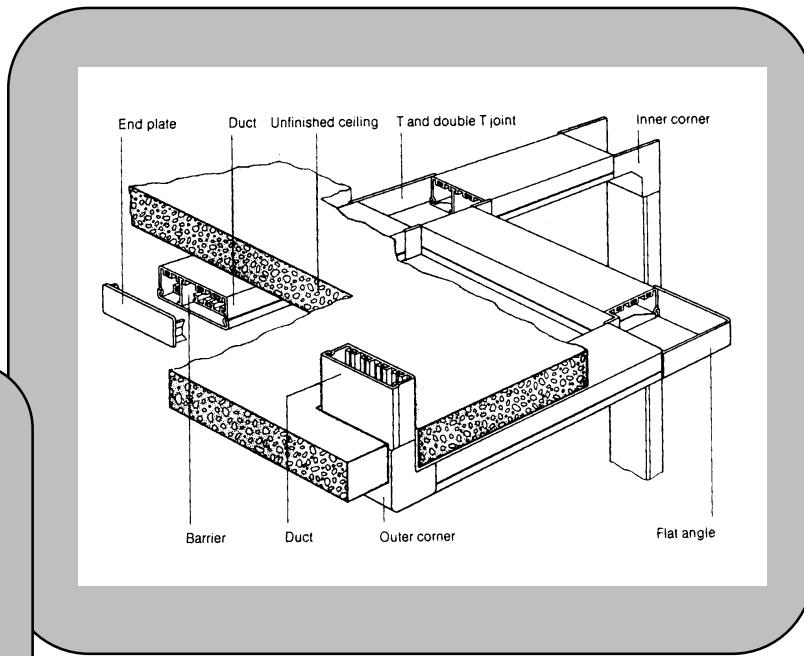
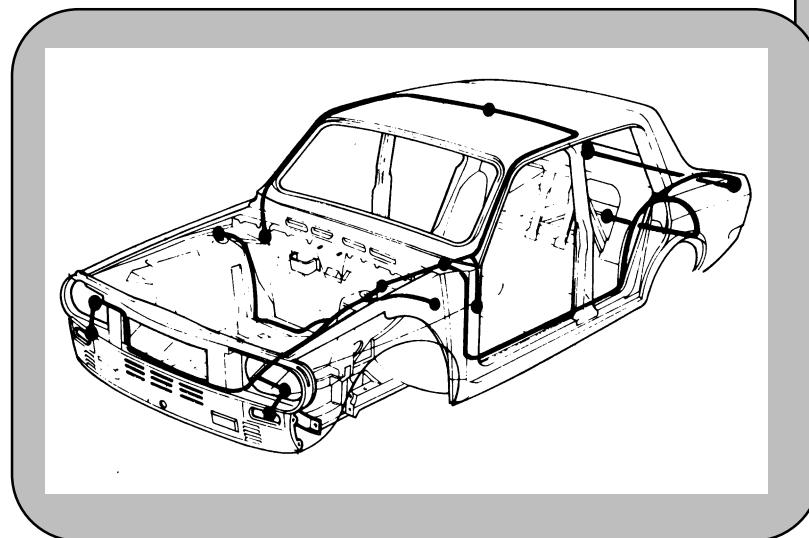
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# Arrangement and Installation

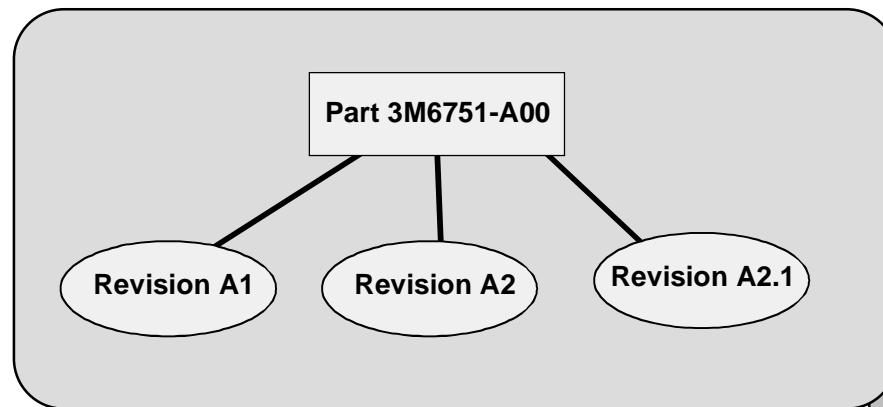
- Detailed routing information
- Locations and environmental conditions
- Reference to 3D shape information



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# Administrative data



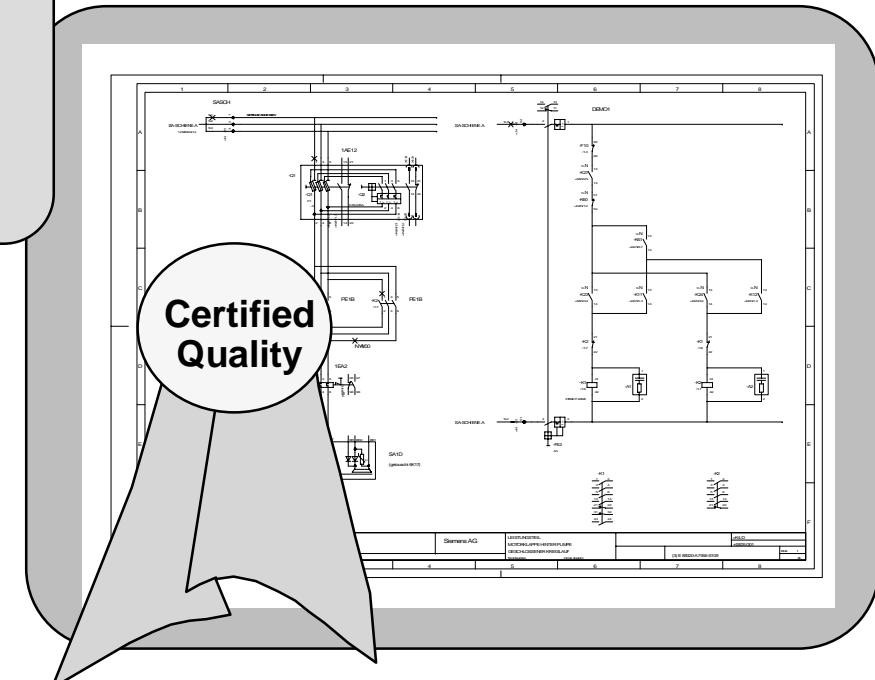
**Versioning of functions and products**



**Release data**



**Information about author, editor,  
inspector, etc**



# Properties



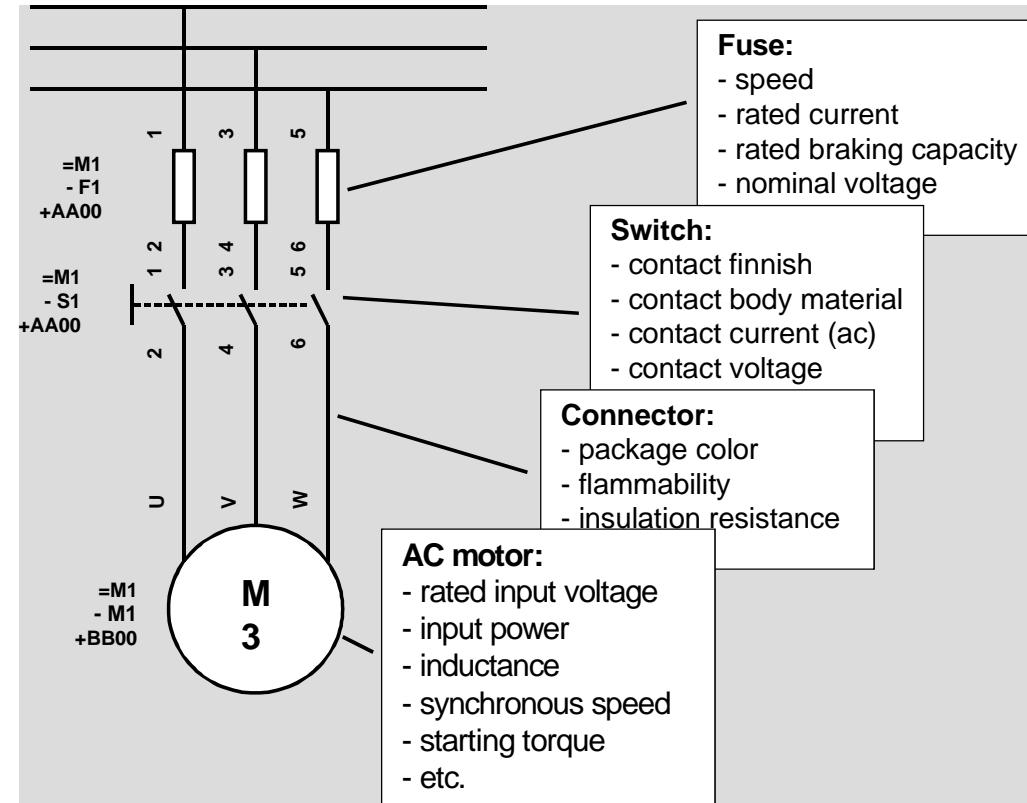
**Predefined data elements**



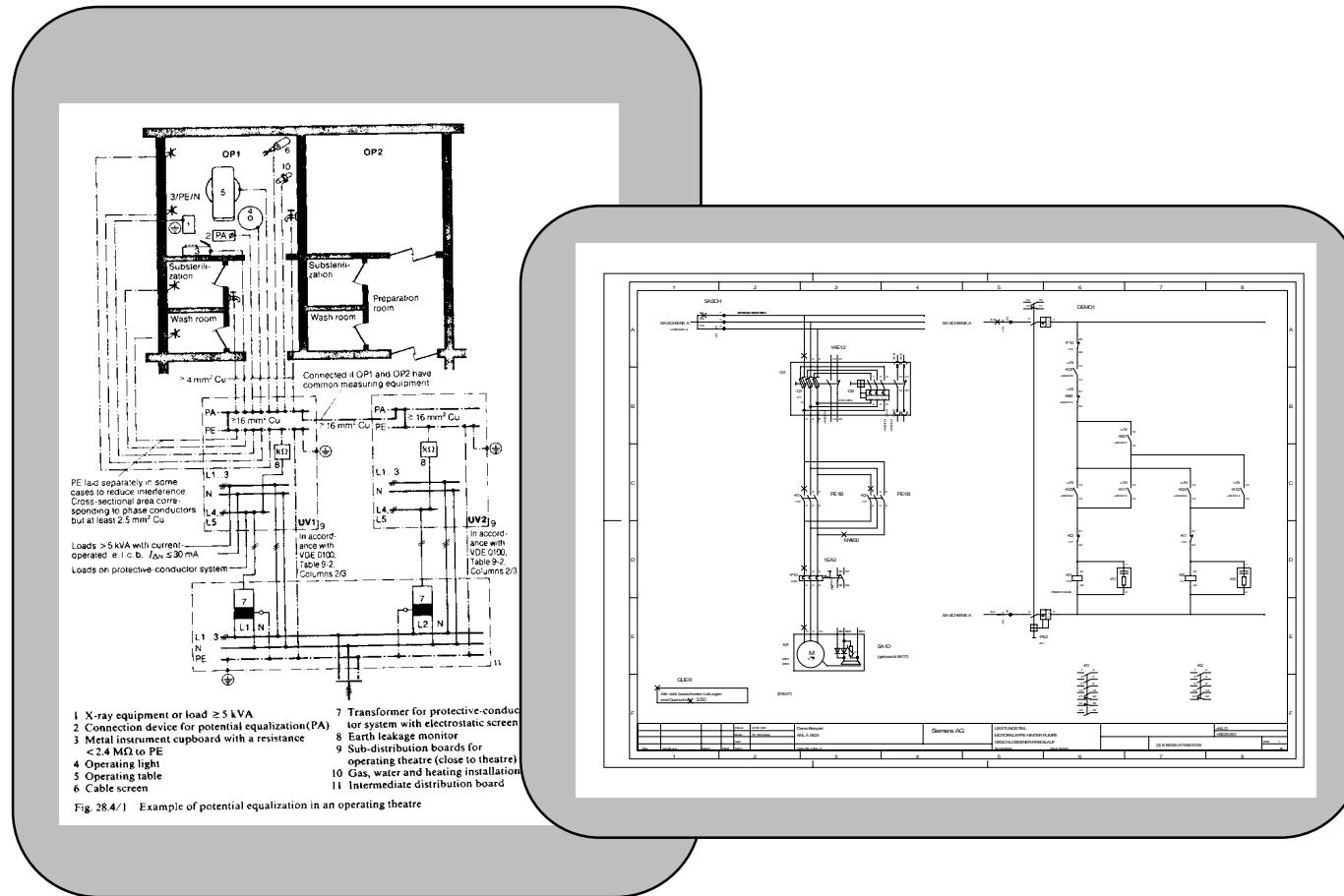
**Support of standardized repositories, such as IEC 1360 or ISO 13584-42**



**Company specific data elements**



# Documentation



- Circuit diagrams
- Cable diagrams
- Arrangement drawings
- other 2D- drawings

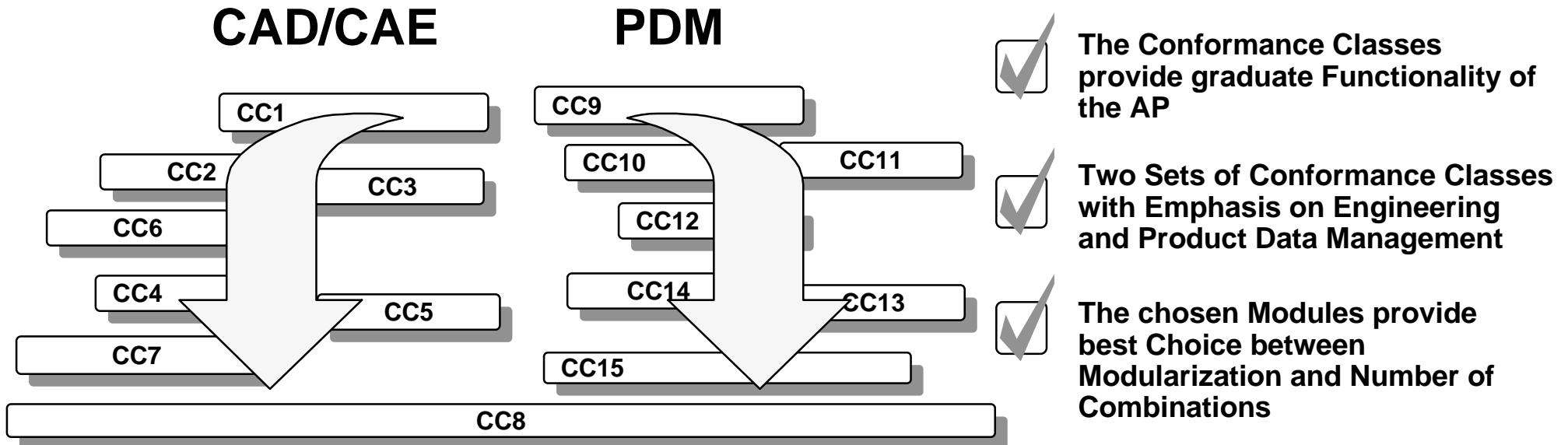
# AP 212 - Design Principles

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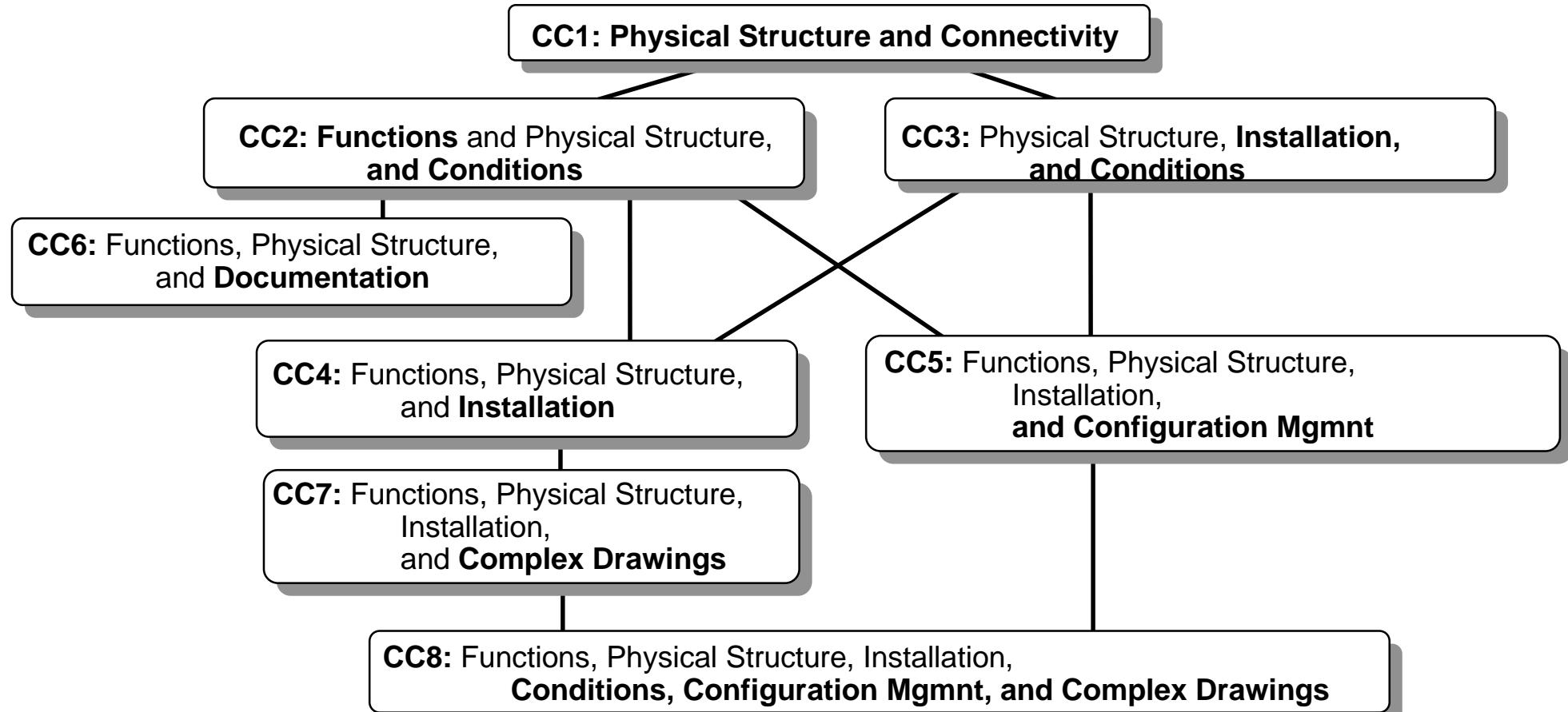
- ➡ **be explicit**
- ➡ **be generic**
- ➡ **be modular**



# AP212 - Conformance Classes



# Conformance Classes - CAE



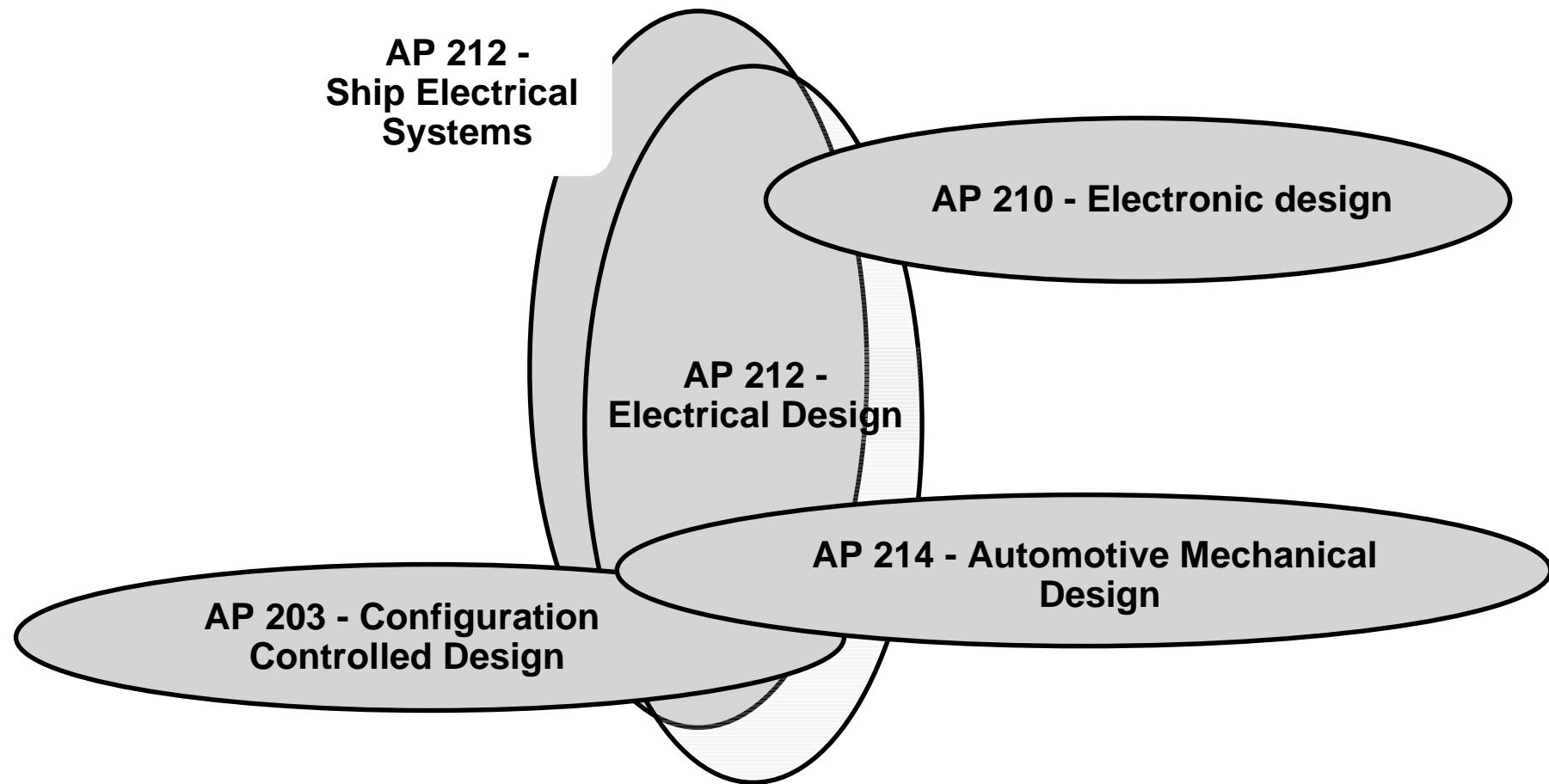
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# AP212 - Conformance Classes

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
allocation		x		x	x	x	x	x	x		x	x	x	x	x
classification	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
conditions		x	x	x	x	x	x	x							
configuration_management					x			x			x	x	x	x	x
course			x	x	x		x	x							
dimensioned_documentation							x	x							x
documentation						x	x	x					x	x	
effectivity_data					x			x	x	x	x	x	x	x	x
external_reference	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
functional_connectivity		x		x	x	x	x	x							
function_structure		x		x	x	x	x	x		x		x	x	x	x
installation			x	x	x		x	x							
designation	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
messages		x		x	x	x	x	x							
network_allocation		x		x	x	x	x	x							
organizational_data	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
physical_connectivity	x	x	x	x	x	x	x	x							
product_structure	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
properties	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
remark	x	x	x	x	x	x	x	x		x	x	x	x	x	x
schematic_documentation						x	x	x					x	x	
site			x	x	x		x	x		x		x	x	x	x
work_management				x			x	x	x	x	x	x	x	x	x

# Harmonization with other APs



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# Point of Contact

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